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(71) Applicant and

(72) Inventor: PARK, Hyuck-Sang [KR/KR]; 103-902,  
Sungwon-2nd Apt., Inchang-dong, Guri-si, Kyungki-do  
471-737 (KR).

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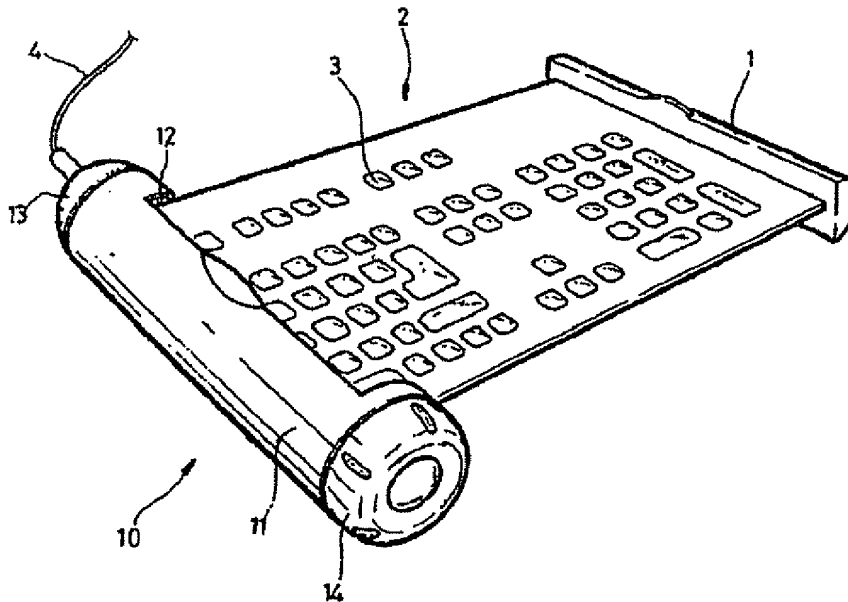
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(74) Agents: LEE, Chul et al.; 2F. Changsang-Building,  
1543-12, Seocho-3dong, Seocho-ku, Seoul 137-872 (KR).

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(54) Title: PORTABLE KEYBOARD



(57) Abstract: Disclosed is a portable keyboard. The portable keyboard comprises a flexible key mount having a plurality of keys which are embossedly formed thereon; a body for winding up and winding off the key mount, with the key mount affixed at one end thereof to the body; a holder connected to the other end of the key mount for enabling the key mount wound on the body to be drawn out from the body and for supporting the drawn-out key mount; and a cord connected to the body for supplying power to the key mount.

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## PORTABLE KEYBOARD

## BACKGROUND OF THE INVENTION

## 5 Field of the Invention

The present invention relates to a keyboard, and more particularly, the present invention relates to a portable keyboard which can be conveniently carried around.

10

## Description of the Related Art

Generally, a keyboard includes a hard case of a fairly large size, a plurality of keys, a key mount which has a flexible printed circuit board and on which the plurality of keys are mounted, and a cord for supplying power to the keyboard.

15

In recent years, as the development and explosive use of the information and data network known as the Internet has led to advances in computer hardware and software, portability of a computer has been acutely required. In order to meet this expectation, a portable computer of a compact size has been commercialized.

20

Also, software is built in a portable radiotelephone so as to allow a person to do Internet

using the portable radiotelephone irrespective of time and place.

However, since each of the portable computer and portable radiotelephone is limited in a size, a size of a keyboard which is used for inputting operating instructions or data to a computer system, cannot but be decreased.

As a consequence, a problem is caused in that, because it is impossible to rapidly input a great deal of data by pressing keys of a small size, effectiveness and practicality of the portable computer or portable radiotelephone is deteriorated.

#### SUMMARY OF THE INVENTION

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Accordingly, the present invention has been made in an effort to solve the problems occurring in the related art, and an object of the present invention is to provide a portable keyboard which can be conveniently carried around and allows operating instructions or data to be rapidly and correctly inputted.

20

In order to achieve the above object, according to one aspect of the present invention, there is provided a portable keyboard comprising: a flexible key mount having

a plurality of keys which are embossedly formed thereon;  
a body for winding up and winding off the key mount, with  
the key mount affixed at one end thereof to the body; a  
holder connected to the other end of the key mount for  
5 enabling the key mount wound on the body to be drawn out  
from the body and for supporting the drawn-out key mount;  
and a cord connected to the body for supplying power to  
the key mount.

By the feature of the present invention, when the  
10 portable keyboard is carried around, a key mount on which  
a plurality of keys are mounted, is wound up into a  
cylindrical body, and, when the portable keyboard is  
used, a holder which is connected to one end of the key  
mount, is drawn out from the cylindrical body so as to  
15 unwind the key mount. Consequently, advantages are  
provided in that the portable keyboard can be  
conveniently carried around in a state wherein its volume  
is minimized, and, upon use, the portable keyboard can be  
spread to the maximum and thereby operating instructions  
20 and data can be rapidly and correctly inputted.

#### BRIEF DESCRIPTION OF THE DRAWINGS

The above objects, and other features and

advantages of the present invention will become more apparent after a reading of the following detailed description when taken in conjunction with the drawings, in which:

5           FIG. 1 is a perspective view illustrating a portable keyboard in accordance with an embodiment of the present invention;

          FIG. 2 is a perspective view illustrating a state wherein a holder of the portable keyboard according to  
10          the present invention is being drawn out toward a use position;

          FIG. 3 is an exploded perspective view of the portable keyboard according to the present invention;

          FIG. 4 is a cross-sectional view of FIG. 2; and

15          FIGS. 5 through 7 are cross-sectional views illustrating a portable keyboard in accordance with another embodiment of the present invention.

#### DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

20

Reference will now be made in greater detail to a preferred embodiment of the invention, an example of which is illustrated in the accompanying drawings. Wherever possible, the same reference numerals will be

used throughout the drawings and the description to refer to the same or like parts.

Referring to FIGs. 1 and 2, a portable keyboard in accordance with an embodiment of the present invention largely includes a body 10, a key mount 2, a holder 1 and a cord 4.

As can be readily seen from FIGs. 3 and 4, the body 10 has a cylindrical case 11 which is defined with a drawing opening 12. The drawing opening 12 extends in an axial direction.

A first cap 13 and a second cap 14 are respectively coupled to both ends of the cylindrical case 11. The second cap 14 has a ratchet gear 15 which is secured to an inner surface thereof.

A hollow shaft 16 is arranged in the case 11 and is defined at one end thereof with an engaging groove 17. A coupling piece 18 is coupled to the hollow shaft 16 adjacent to the first cap 13 and is formed with an engaging projection 19 which is engaged into the engaging groove 17 of the hollow shaft 16.

An elongate fixing pin 20 is fitted through the coupling piece 18. One end of the elongate fixing pin 20 is positioned in the hollow shaft 16, and the other end of the elongate fixing pin 20 is fastened to the first

cap 13.

Both ends of a torsional coil spring 21 are secured to the elongate fixing pin 20 in the hollow shaft 16, in a manner such that the torsional coil spring 21 elastically rotates the hollow shaft 16 and biases the hollow shaft 16 toward the first cap 13 when a push pin 24 as will be described below is pressed.

An actuating member 22 is coupled to the other end of the hollow shaft 16 adjacent to the second cap 14. The actuating member 22 is formed, at a surface thereof facing the ratchet gear 15 of the second cap 14, with a pawl 23 which can be meshed with the ratchet gear 15 of the second cap 14. The actuating member 22 has the push pin 24 which projects outward through the second cap 14.

On the other hand, one end of the key mount 2 which has a plurality of keys 3, is affixed to the hollow shaft 16 along the axial direction. The plurality of keys 3 are embossedly formed on the key mount 2. The key mount 2 is made of a flexible material. The cord 4 is connected to the key mount 2.

The holder 1 is connected to the other end of the key mount 2 for enabling the key mount 2 which is wound on the body 10, to be drawn out from the body 10 and for supporting the drawn-out key mount 2.

The portable keyboard according to the present invention, constructed as mentioned above, is carried around in a state wherein the key mount 2 is wound up into the body 10 as shown in FIG. 1. When the portable  
5 keyboard is used, the holder 1 is drawn out from the cylindrical body 10 so as to unwind the key mount 2.

As the key mount 2 is unwound, the hollow shaft 16, the coupling piece 18 which is coupled to the hollow shaft 16, and the actuating member 22 are rotated, and at  
10 this time, the torsional coil spring 21 is elastically deformed.

Because the hollow shaft 16 can be rotated only in one direction by mesh between the pawl 23 of the actuating member 22 and the ratchet gear 15 of the second  
15 cap 14, if the holder 1 is released after being drawn out from the body 10, the hollow shaft 16 is not reversely rotated and the key mount 2 is maintained in a spread state, whereby a key inputting operation can be implemented.

20 On the other hand, when it is necessary to wind up the key mount 2 into the body 10, the push pin 24 of the actuating member 22 is pressed. If the push pin 24 is pressed, the torsional coil spring 21 is moved in the axial direction, and the hollow shaft 16 and the coupling

piece 18 are biased toward the first cap 13. The pawl 23 of the actuating member 22 and the ratchet gear 15 of the second cap 14 are disengaged from each other.

As a consequence, as the torsional coil spring 21  
5 which is maintained in a twisted state, is returned to its original shape, the hollow shaft 16 is reversely rotated, and according to this, the key mount 2 is automatically wound up around the hollow shaft 16.

Thus, in the portable keyboard according to the  
10 present invention, if the holder 1 is drawn out from a state shown in FIG. 1, the key mount 2 is unwound from the hollow shaft 16 and spread on a plane. At this time, by the mesh between the ratchet gear 15 and the pawl 23, the spread state of the key mount 2 is maintained. If the  
15 push pin 24 is pressed, as the ratchet gear 15 and the pawl 23 are disengaged from each other, the key mount 2 is wound up around the hollow shaft 16 by returning force of the torsional coil spring 21.

The portable keyboard according to the present  
20 invention can be carried around in a state wherein the key mount 2 is wound up around the hollow shaft 16, and can be conveniently used in a state wherein the key mount 2 is wound off from the hollow shaft 16 and spread on the plane.

Therefore, the portable keyboard can be conveniently carried around in a state wherein its volume is minimized, and, upon use, the portable keyboard can be spread to the maximum and thereby operating instructions and data can be rapidly and correctly inputted.

FIGS. 5 through 7 are cross-sectional views illustrating a portable keyboard in accordance with another embodiment of the present invention. The portable keyboard according to this embodiment of the present invention largely includes a key mount 2' which is made of a flexible material, a holder 1' which is connected to one end of the key mount 2' for enabling the key mount 2' to be drawn out, and a body 30 which is affixed to the other end of the key mount 2' for allowing the key mount 2' to be wound thereon.

Here, the body 30 has a cylindrical case 31. The cylindrical case 31 has a fixed shaft 35 which is centrally arranged in the cylindrical case 31 and extends in an axial direction. The cylindrical case 31 is formed, on a circumferential inner surface thereof, with an engaging projection 32 which is composed of first and second projecting parts 33 and 34.

A rotating plate 36 is coupled to the fixed shaft 35 of the cylindrical case 31. The rotating plate 36 has

one surface on which the key mount 2' is wound on a cylindrical part (not shown). A spring 37 is provided on the other surface of the rotating plate 36. The spring 37 is secured at one end thereof to the fixed shaft 35 and  
5 at the other end thereof to the other surface of the rotating plate 36 for elastically rotating the rotating plate 36.

A leaf spring 38 is lop-sidedly coupled to the other surface of the rotating plate 36. The leaf spring  
10 38 has substantially a U-shaped configuration which defines a seating groove 39. A rotating lever 41 is rotatably coupled to a center shaft 40 which is formed on the other surface of the rotating plate 36 at a center portion of the leaf spring 38. The rotating lever 41 is  
15 formed at one end thereof with a supporting part 42 which is selectively attached to or detached from the leaf spring 38 defining the seating groove 39 and at the other end thereof with an actuating part 43 which is selectively engaged with or disengaged from the first and  
20 second projecting parts 33 and 34 of the engaging projection 32.

The portable keyboard according to this embodiment of the present invention, constructed as mentioned above, is carried around in a state wherein the key mount 2' is

wound up on the body 30. When the portable keyboard is used, by drawing out the holder 1', the key mount 2' is wound off from the body 30. At this time, once the key mount 2' is spread on a plane by being drawn out from the body 30 which is structured aforementioned above, the key mount 2' is not willing to be wound up again on the body 30 and instead, is maintained in a spread state. In this state, if the key mount 2' is further slightly drawn out and then released, the key mount 2' is wound up on the body 30.

That is to say, after the key mount 2' is sufficiently drawn out from the body 30 in an "A" direction so as to be used, if the key mount 2' is released in a "D" range, as the rotating plate 36 is rotated in a "B" direction by returning force of the spring 37, the actuating part 43 of the rotating lever 41 is supported by the first projecting part 33 of the engaging projection 32.

Here, a rotation radius which extends from a center of the rotating lever 41 to a free end of the actuating part 43, is established to be longer than a distance  $r$  which extends from the center shaft 40 to the engaging projection 32 and to be smaller than a distance  $R$  which extends from the center shaft 40 to the circumferential

inner surface of the cylindrical case 31.

Therefore, in a state wherein the actuating part 43 is supported by the first projecting part 33, no matter how strong the returning force of the spring 37 is, the rotating plate 36 cannot be rotated.

Hence, the key mount 2' is not wound up on the body 30 and instead, maintained in the spread state, whereby a key inputting operation can be implemented.

In the meanwhile, after the key inputting operation is completed, if the holder 1' is further slightly drawn out and then released, the key mount 2' is wound up into the body 30. If the key mount 2' is drawn out in a manner such that the actuating part 43 of the rotating lever 41 goes beyond the "D" range, and then is released, the actuating part 43 of the rotating lever 41 is supported by the second projecting part 34.

Here, due to the fact that the returning force of spring 37 is larger than coupling force between the supporting part 42 of the rotating lever 41 and the leaf spring 38 defining the seating groove 39, as the supporting part 42 is detached from the seating groove 39 by the returning force of the spring 37, the rotating lever 41 is rotated as shown in FIG. 7. As a consequence, the rotating plate 36 is rotated until the key mount 2'

is completely wound up on the body 30.

The portable keyboard according to the present invention can have a small and convenient-to-carry size when not used, and can be spread to the maximum when  
5 used, as can be readily seen from FIGs. 1 through 6. By once drawing out the holder, the key mount is spread. And, by further slightly drawing and releasing the holder, the key mount is wound up on the body, whereby drawing and winding operations of the key mount can be  
10 implemented in a convenient manner.

As a result, when the portable keyboard is carried around, a key mount on which a plurality of keys are mounted, is wound up into a cylindrical body, and, when the portable keyboard is used, a holder which is  
15 connected to one end of the key mount, is drawn out from the cylindrical body so as to unwind the key mount. Consequently, advantages are provided in that the portable keyboard can be conveniently carried around in a state wherein its volume is minimized, and, upon use, the  
20 portable keyboard can be spread to the maximum and thereby operating instructions and data can be rapidly and correctly inputted.

In the drawings and specification, there have been disclosed typical preferred embodiments of the invention

and, although specific terms are employed, they are used in a generic and descriptive sense only and not for purposes of limitation, the scope of the invention being set forth in the following claims.

WHAT IS CLAIMED IS:

1. A portable keyboard comprising:
  - a flexible key mount having a plurality of keys
  - 5 which are embossedly formed thereon;
  - a body for winding up and winding off the key mount, with the key mount affixed at one end thereof to the body;
  - a holder connected to the other end of the key
  - 10 mount for enabling the key mount wound on the body to be drawn out from the body and for supporting the drawn-out key mount; and
  - a cord connected to the body for supplying power to the key mount.
- 15
2. The portable keyboard as claimed in claim 1, wherein the body comprises:
  - a case defined with a drawing opening which extends in an axial direction;
  - 20 first and second caps respectively coupled to both ends of the case, the second cap having a ratchet gear which is secured to an inner surface thereof;
  - a hollow shaft arranged in the case and defined at one end thereof with an engaging groove;

a coupling piece coupled to the hollow shaft adjacent to the first cap and formed with an engaging projection which is engaged into the engaging groove of the hollow shaft;

5           a fixing pin having one end which is positioned in the hollow shaft and the other end which is fastened to the first cap, the coupling piece being fitted around the fixing pin to be fixedly supported by a middle portion of the fixing pin;

10           a torsional coil spring placed around the fixing pin inside the hollow shaft so as to be capable of elastically rotating the hollow shaft; and

an actuating member coupled to the other end of the hollow shaft adjacent to the second cap and formed, at a surface thereof facing the ratchet gear of the second cap, with a pawl which can be meshed with the ratchet gear, the actuating member having a push pin which projects outward through the second cap.

15

20           3.     The portable keyboard as claimed in claim 1, wherein the body comprises:

a cylindrical case having a fixed shaft which is centrally arranged therein and extends in an axial direction, and formed, on a circumferential inner surface

thereof, with an engaging projection possessing first and second projecting parts;.

5 a rotating plate coupled to the fixed shaft of the cylindrical case and having one surface on which the key mount is arranged;

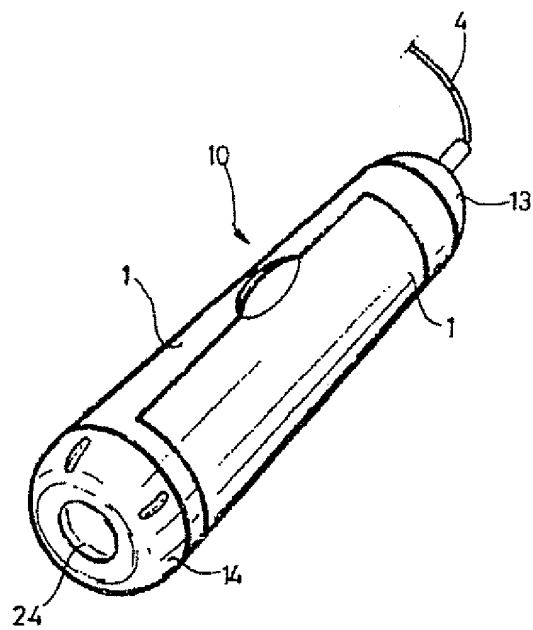
a spring secured at one end thereof to the fixed shaft and at the other end thereof to the other surface of the rotating plate for elastically rotating the rotating plate;

10 a leaf spring lop-sidedly coupled to the other surface of the rotating plate and having substantially a U-shaped configuration which defines a seating groove; and

15 a rotating lever rotatably coupled to a center shaft which is formed on the other surface of the rotating plate at a center portion of the leaf spring, and formed at one end thereof with a supporting part which is selectively attached to or detached from the leaf spring defining the seating groove and at the other  
20 end thereof with an actuating part which is selectively engaged with or disengaged from the first and second projecting parts of the engaging projection.

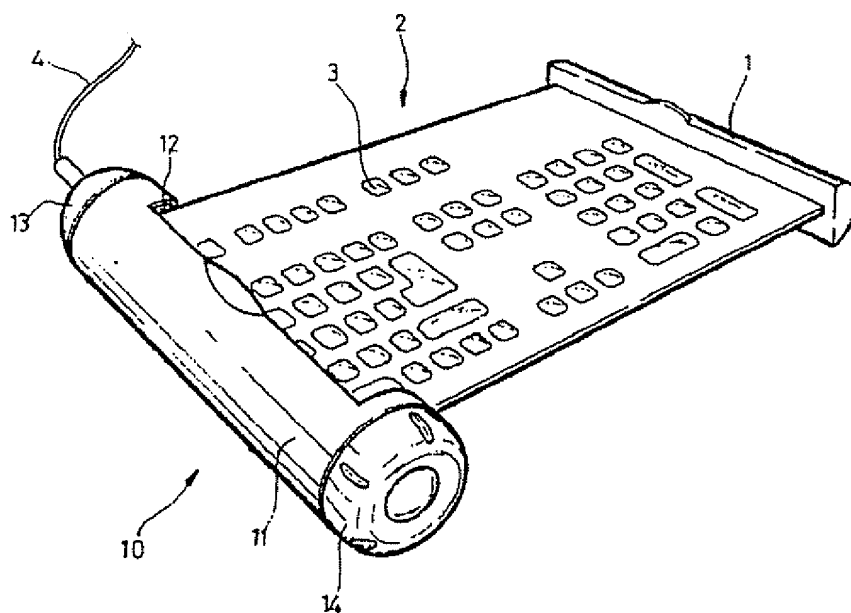
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Fig. 1



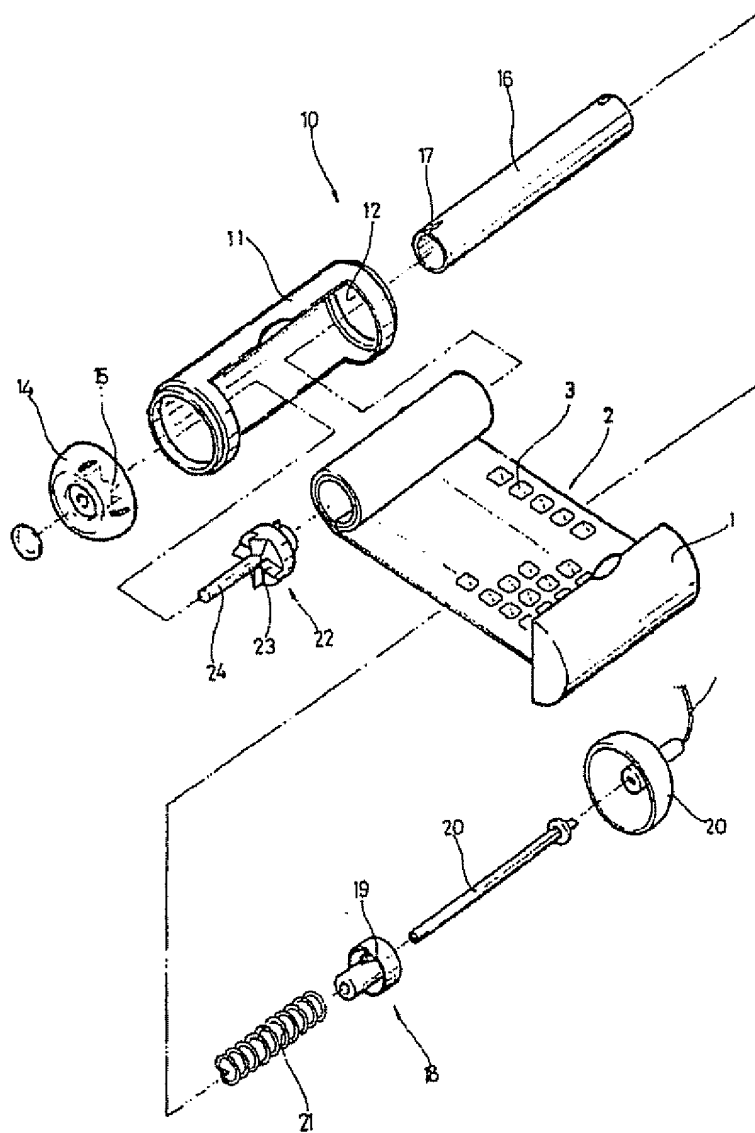
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Fig. 2



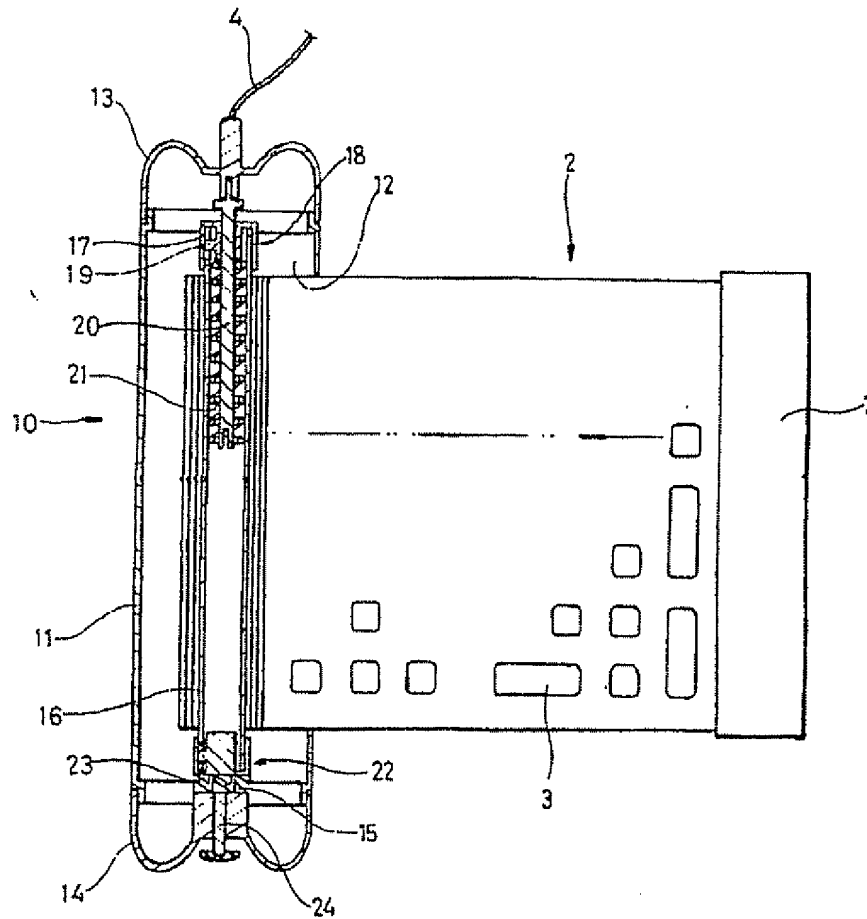
3/7

Fig. 3



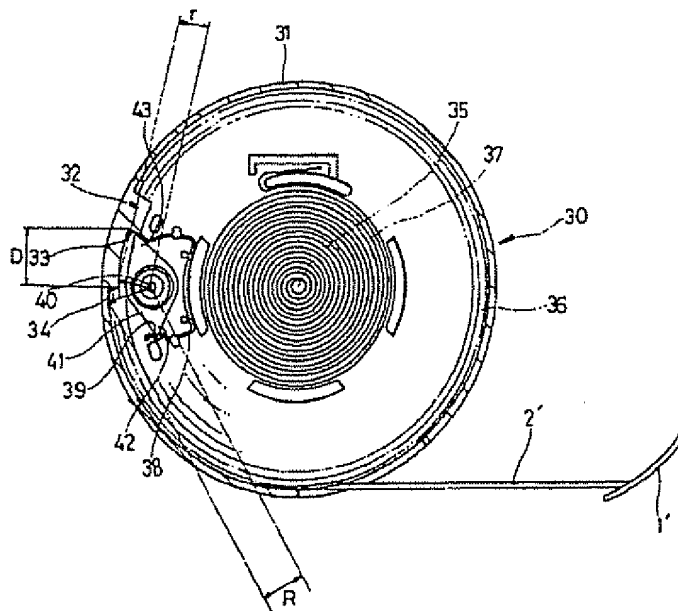
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Fig. 4



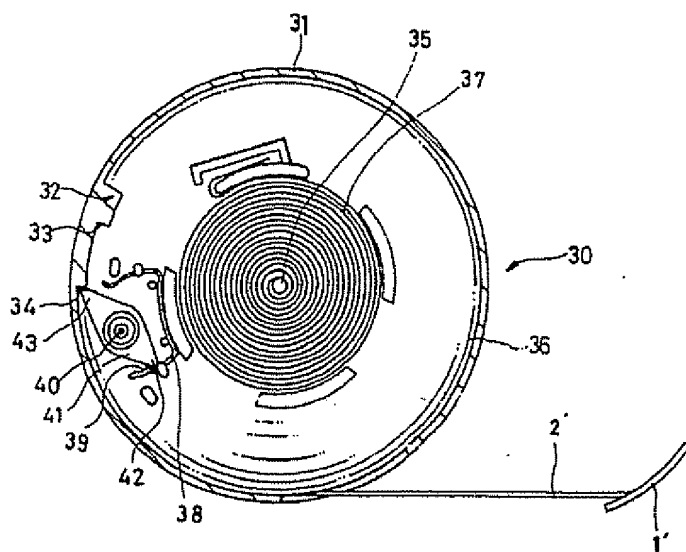
5/7

Fig. 5



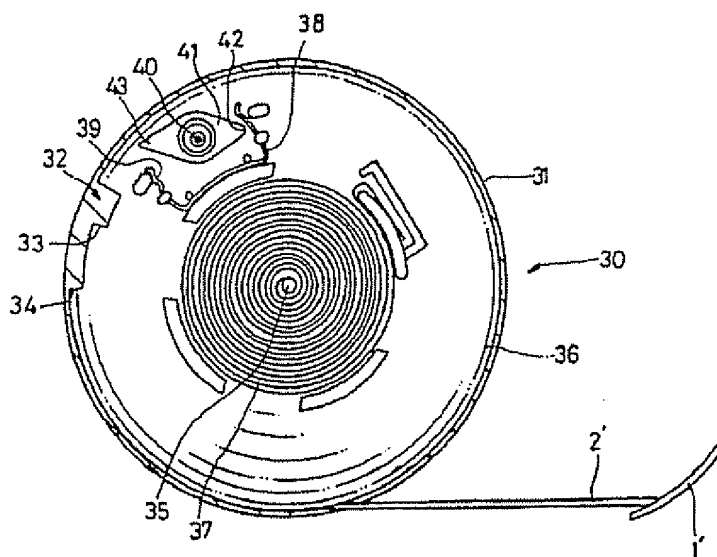
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Fig. 6



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Fig. 7



# INTERNATIONAL SEARCH REPORT

International application No.

PCT/KR00/01274

## A. CLASSIFICATION OF SUBJECT MATTER

**IPC7 G06F 3/02**

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC G06F 3/02, G06F 3/03

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Korean Patent and applications for inventions since 1975

Korean Utility models and applications for Utility models since 1975

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	JP 04-15725 A (HITACHI LTD) 21 JAN 1992 (21. 01. 1992) * abstract and figures	1-3
A	JP 09-218738 A (SANYO ELECTRIC LTD) 19 AUG 1997 (19. 08. 1997) * abstract and figures	1-3
A	KR 99-33127 A (LG ELECTRONIC LTD) 15 MAY 1999 (15. 05. 1999) * whole documents	1-3

☐ Further documents are listed in the continuation of Box C.

☐ See patent family annex.

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Korean Industrial Property Office  
 Government Complex-Taejon, Dunsan-dong, So-ku, Taejon  
 Metropolitan City 302-701, Republic of Korea

Facsimile No. 82-42-472-7140

Authorized officer

CHO, Hyung Hee

Telephone No. 82-42-481-5991

